

# Initial Assessments of Lake Mohave Water Quality

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Lake Mead National Recreation Area

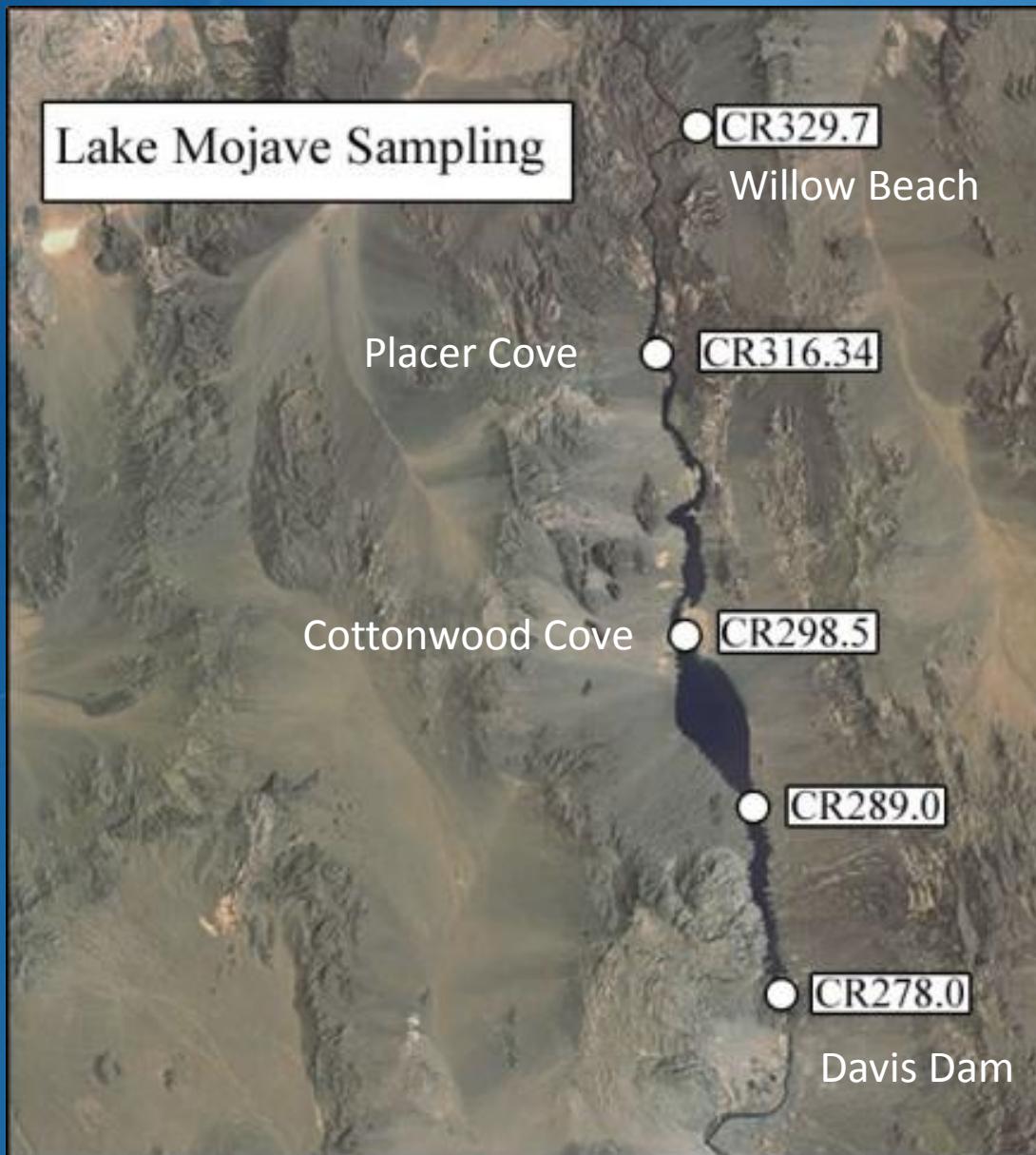
# Questions

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# Justification for sampling

- Basic, monthly information from along the length of the lake lacking
- Microcystis/Algal Blooms in the recent past
- Increased interest due to Big Bend Water Treatment plant
- Some interest in Modeling water quality in the future
- Invasive Species
  - Quagga
  - Plants

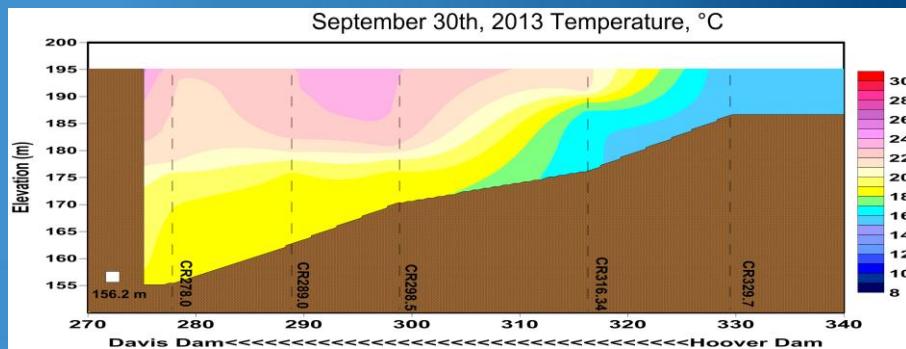
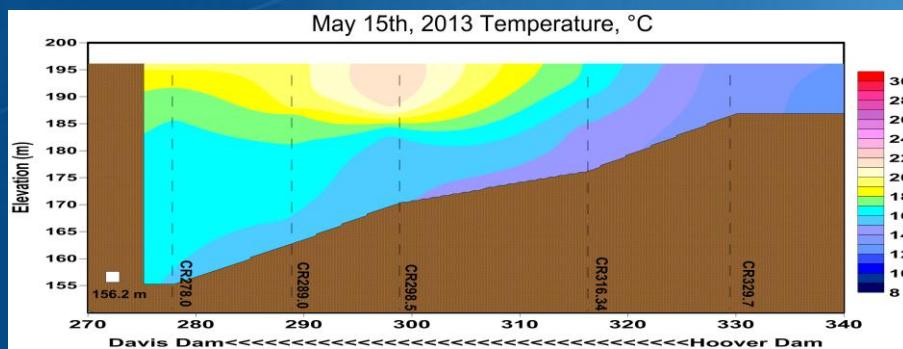
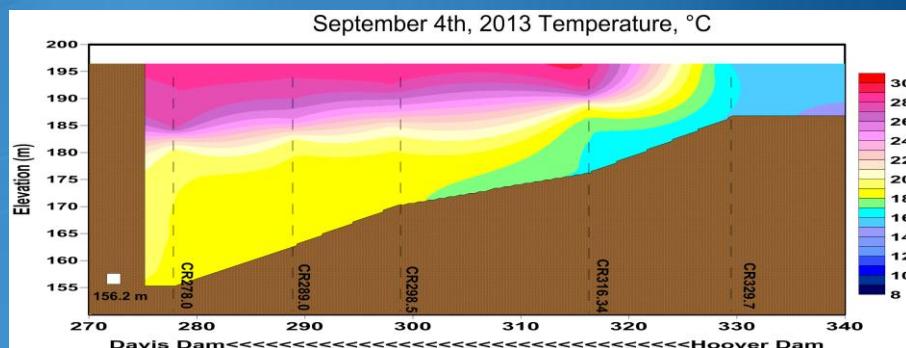
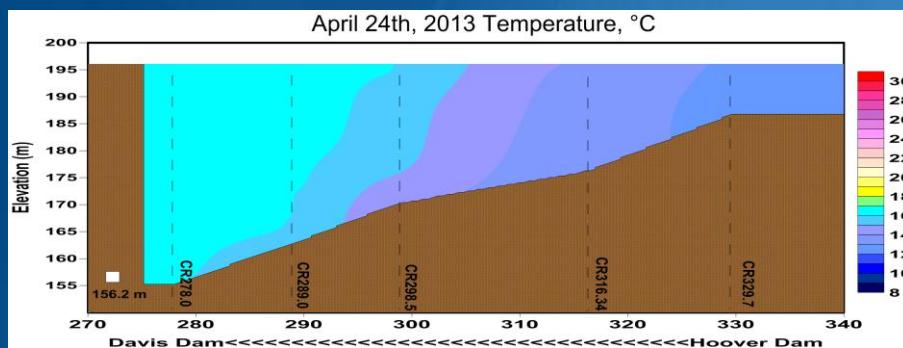
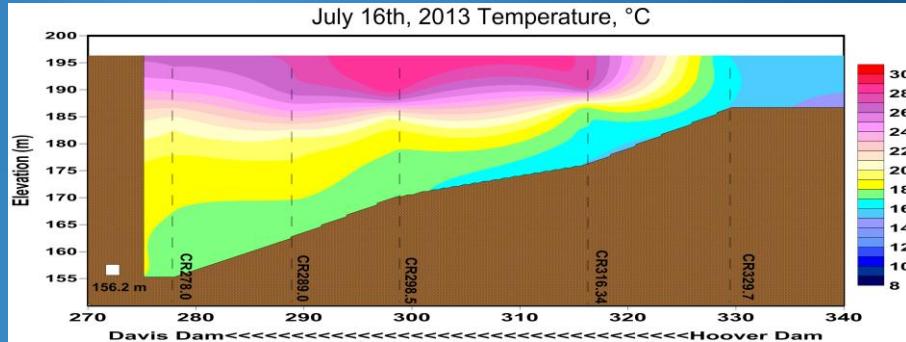
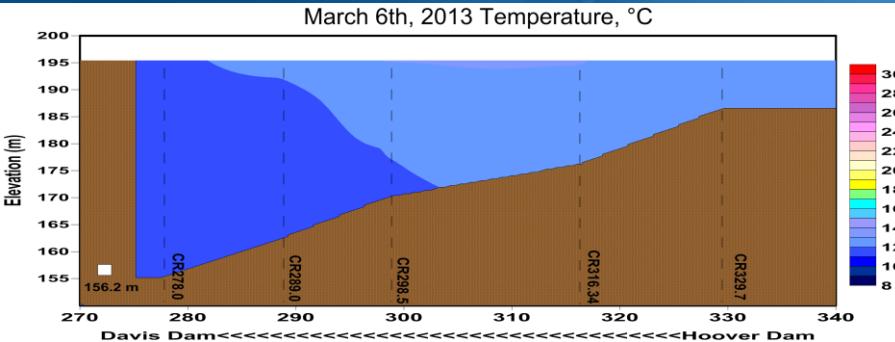
# Sampling Sites



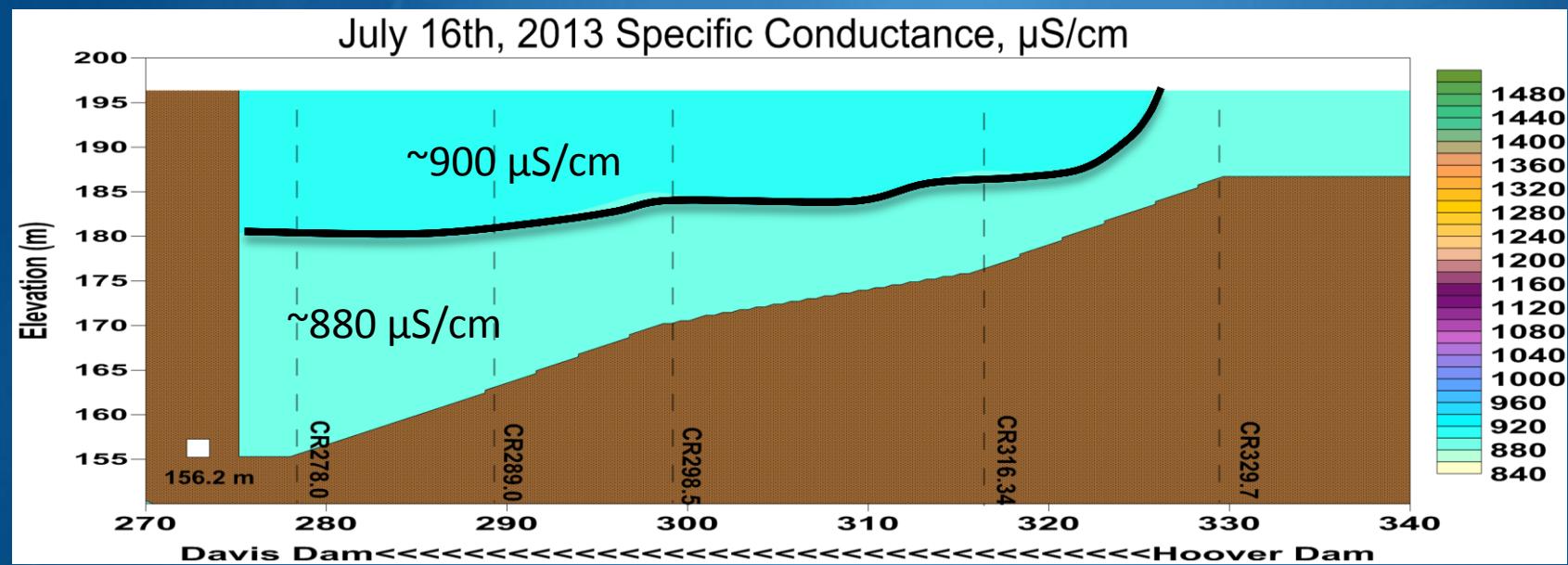
# What we are sampling:

- Basic instrument-based parameters
  - Temperature, specific conductance, dissolved oxygen, pH, turbidity
  - Secchi Disk Depth
- Nutrient parameters (3 depths)
  - Nitrogen
    - Total,  $\text{NO}_2 + \text{NO}_3$ -N, Ammonia
  - Phosphorus
    - Total and Ortho-phosphate
  - Total Organic Carbon
- Biological
  - Chlorophyll a
    - 0 – 5 m integrated and surface
  - Algal Toxins
    - 0 – 5 m integrated and surface
  - Zooplankton
    - Full water column
  - Phytoplankton
    - Surface

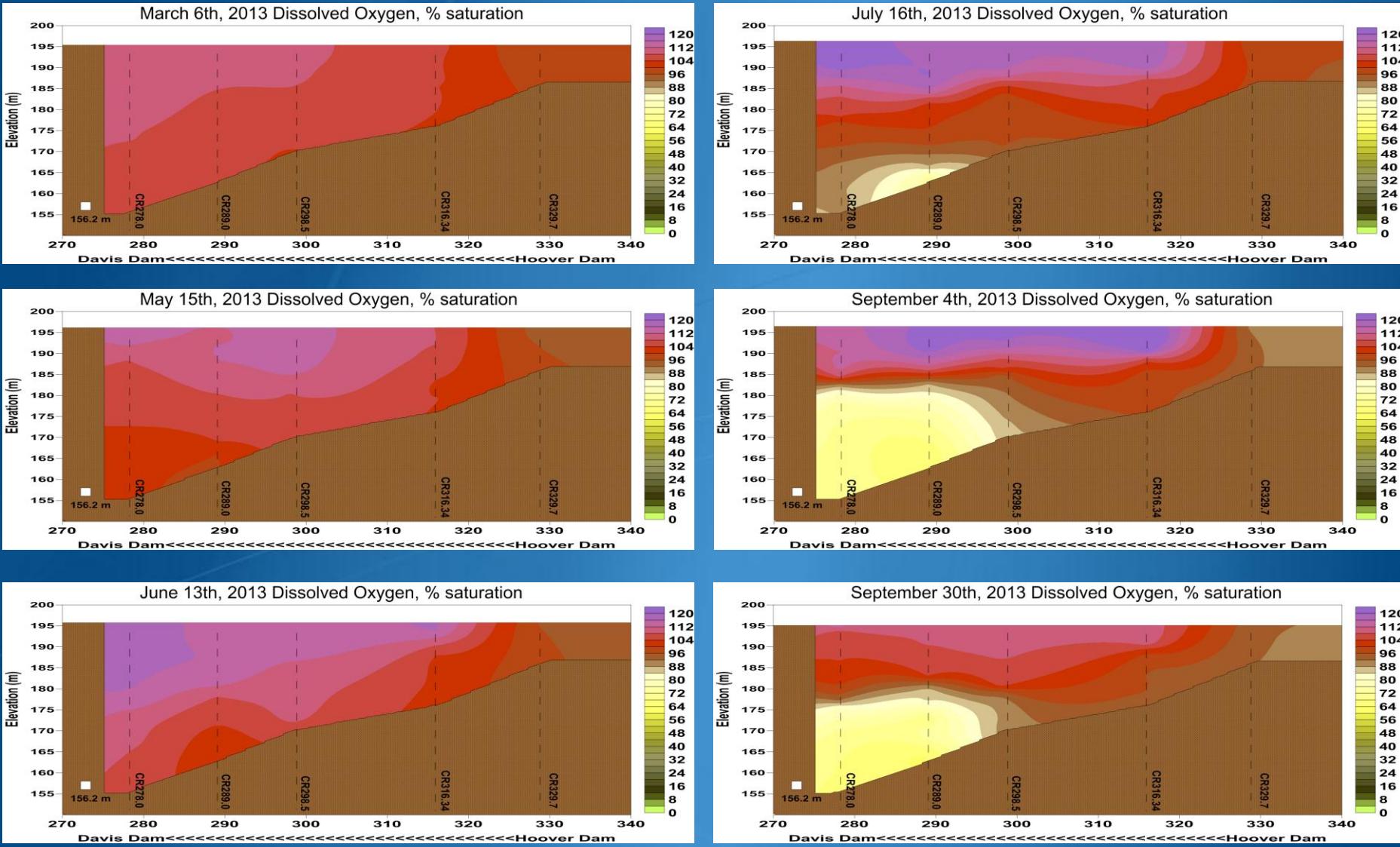
# Temperature patterns



# Specific Conductance Patterns



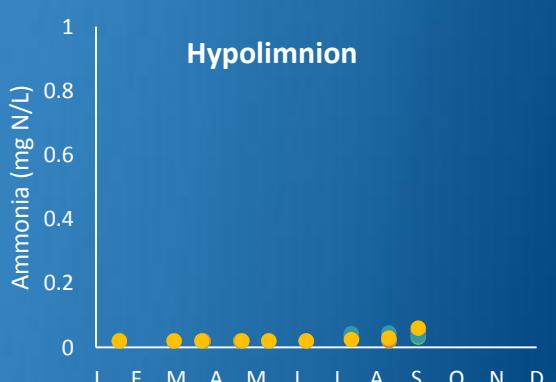
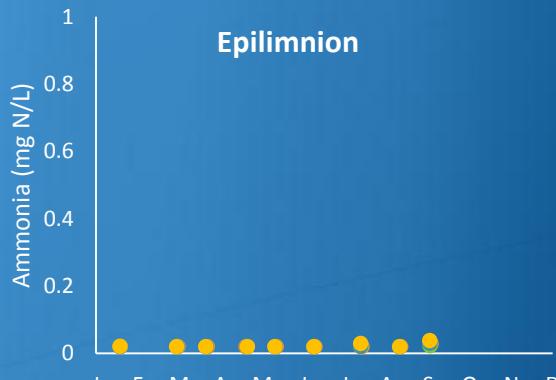
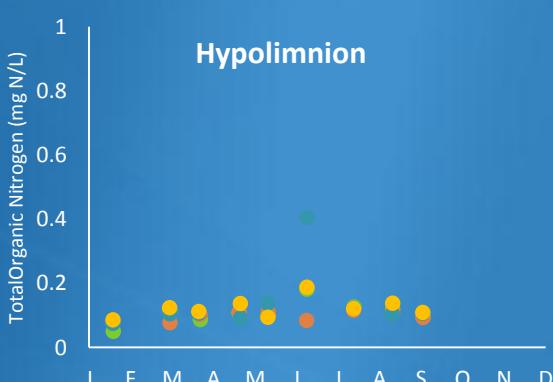
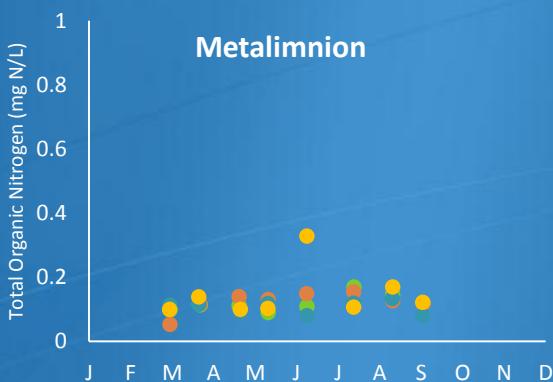
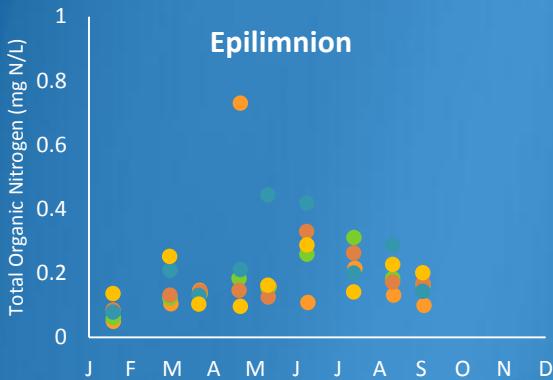
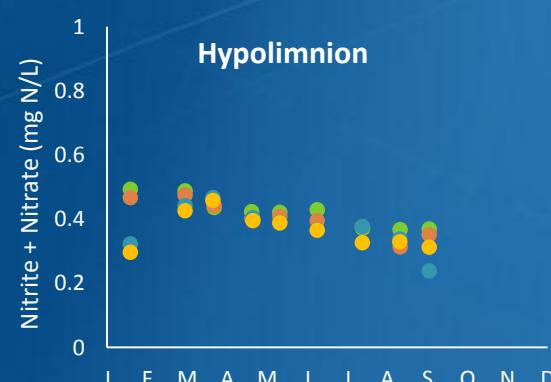
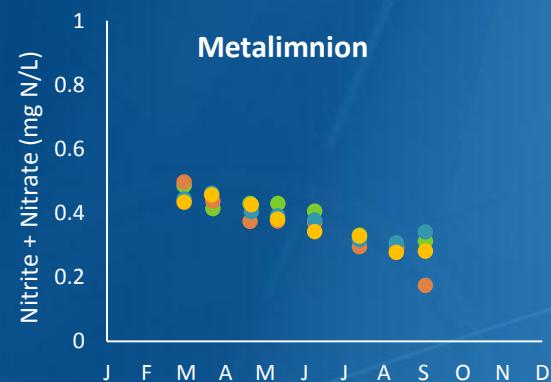
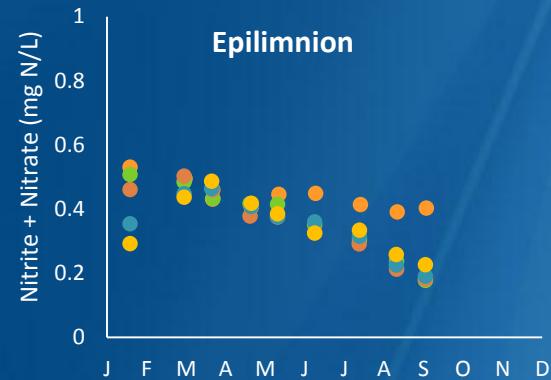
# Dissolved Oxygen Patterns



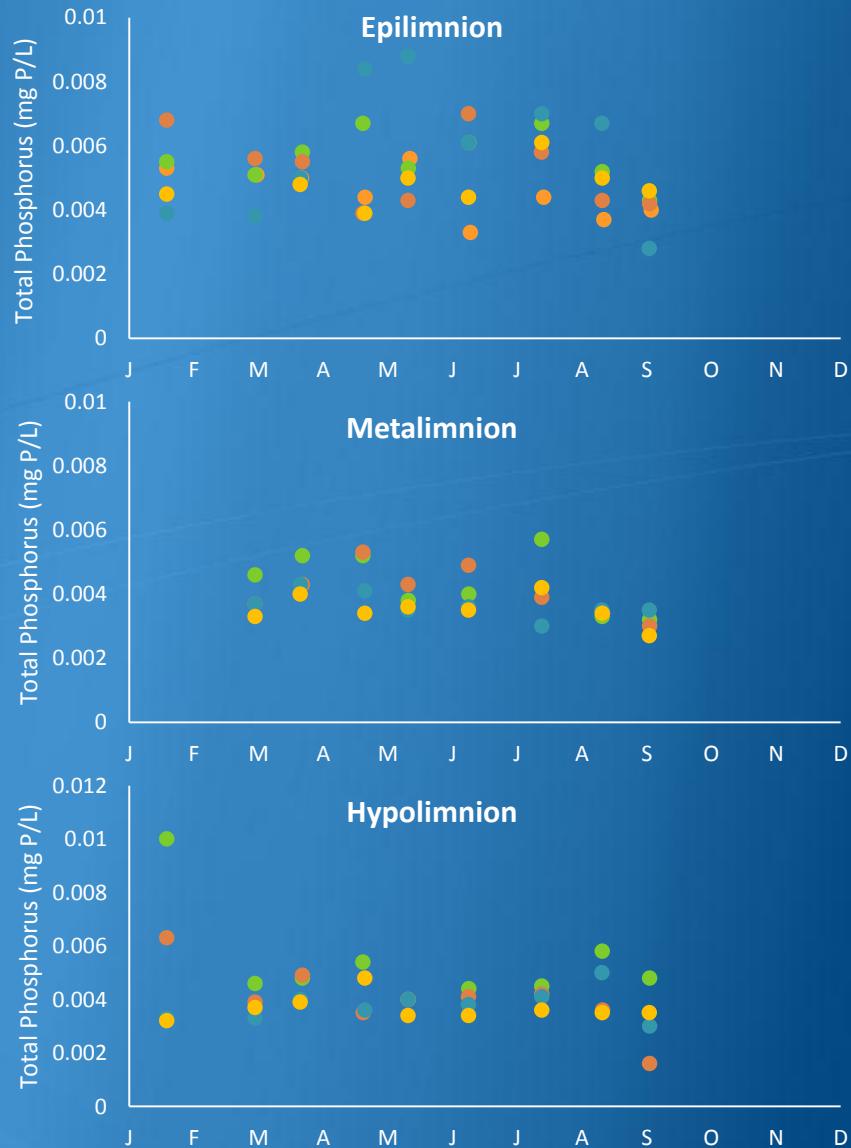
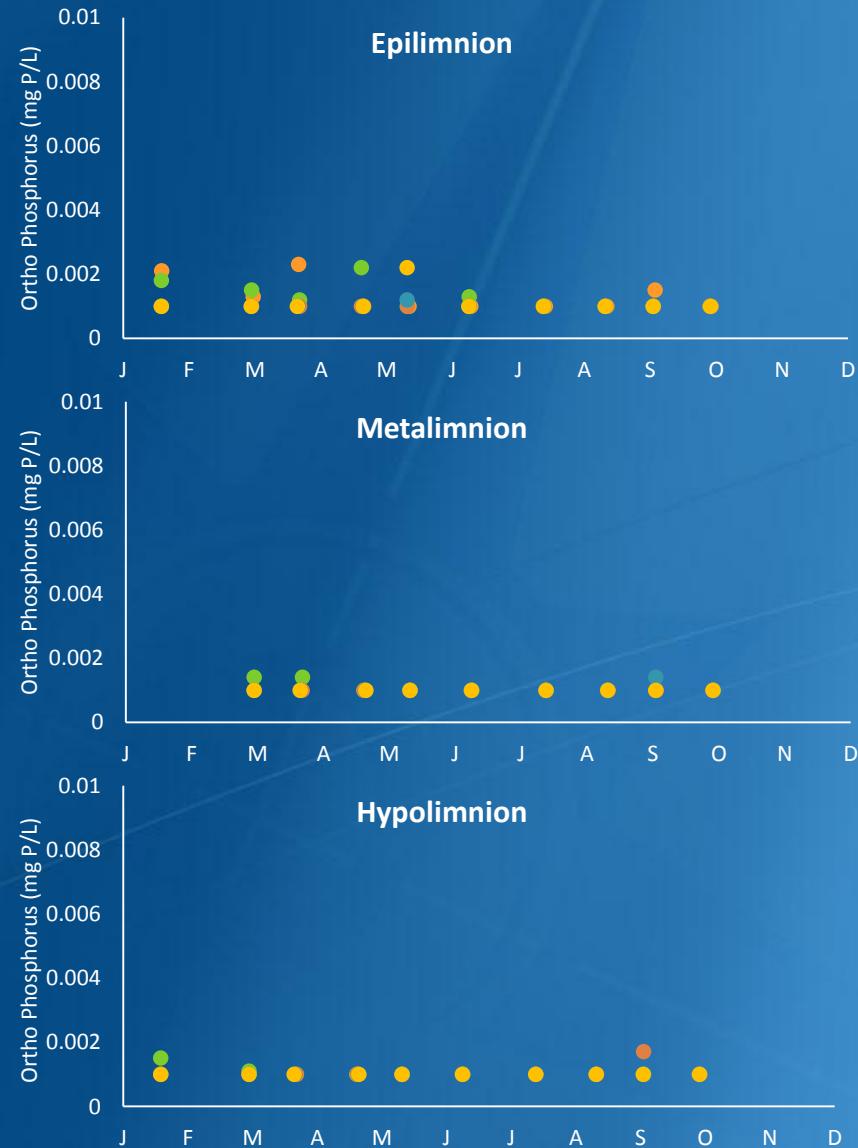
# pH Patterns

- Overall the carbonate buffering system continues to dominate the Colorado River System so values are generally mid-7's to mid-8's, usually 7.8 – 8.2
- More “dynamic” than Lake Mead
  - More variability through the water column at some sites on any given date
  - More variability between sites
- Cause of variability unclear
  - Mixing
  - Biological activity

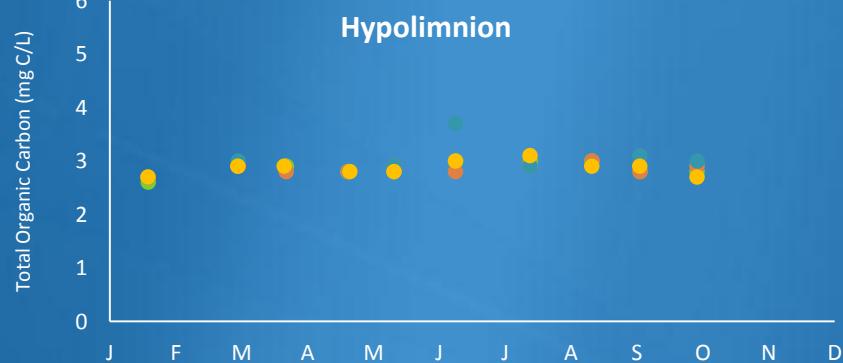
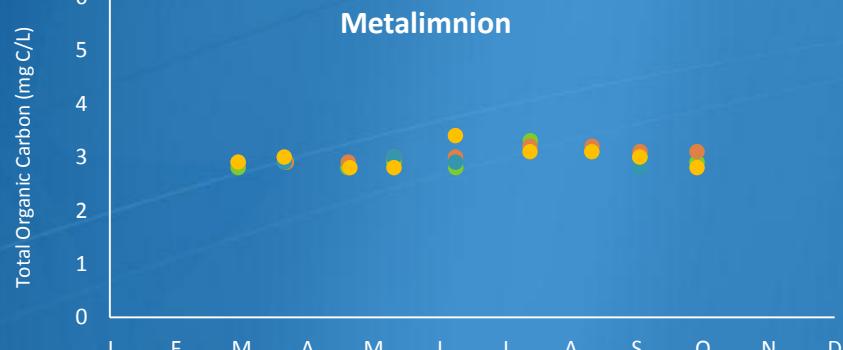
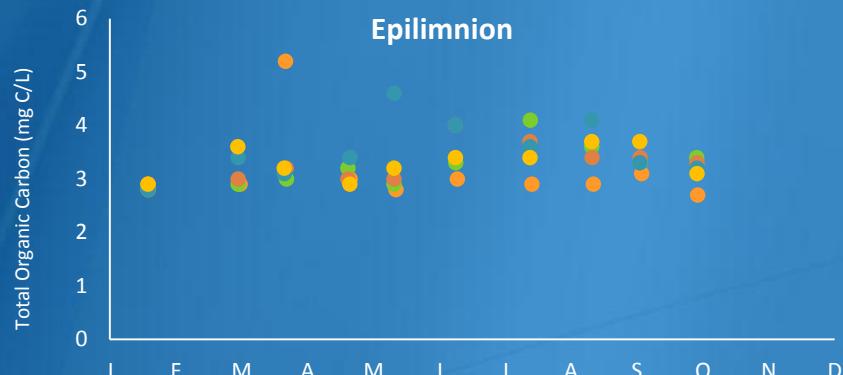
# Nutrient Patterns: Nitrogen



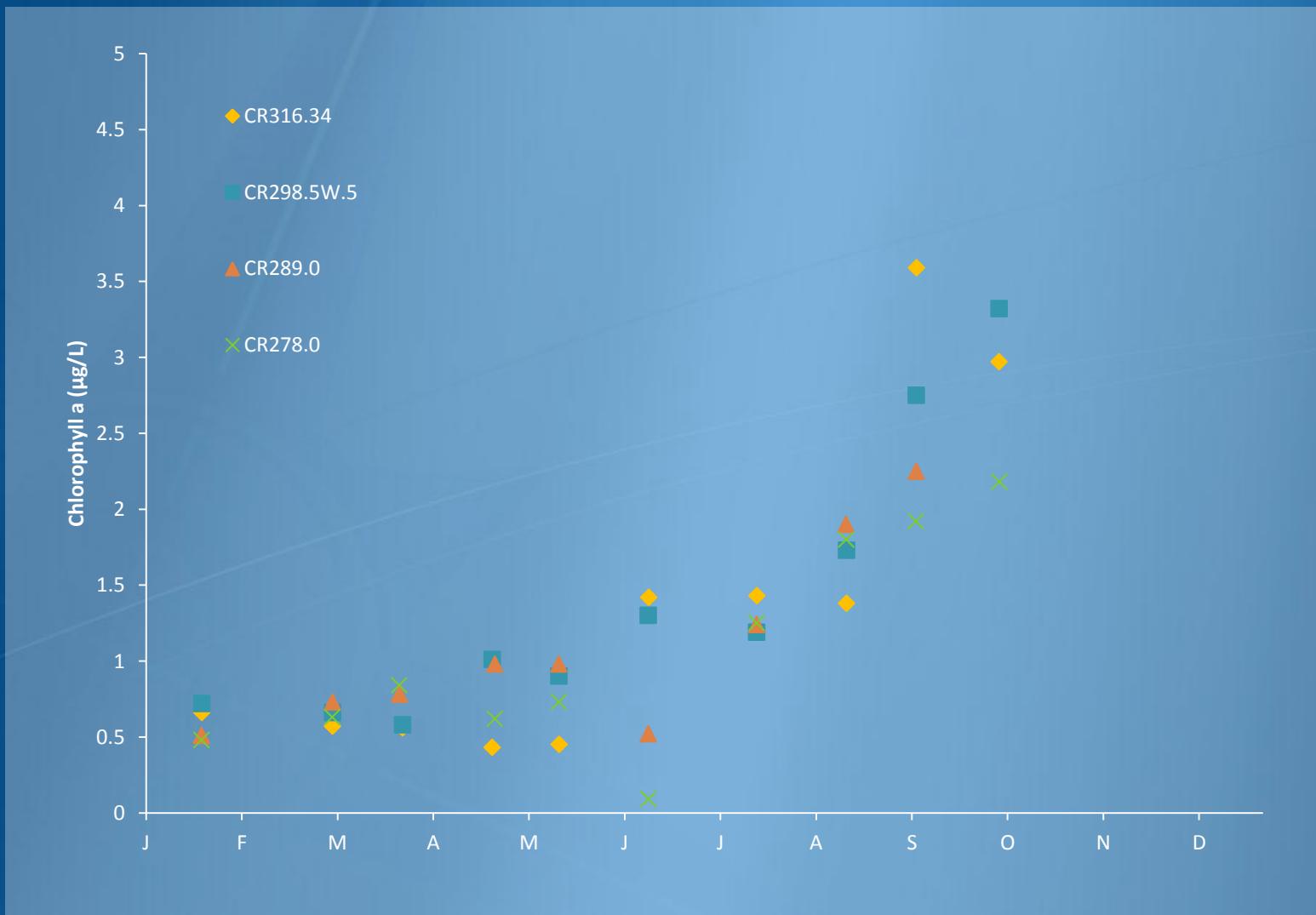
# Nutrient Patterns: Phosphorus



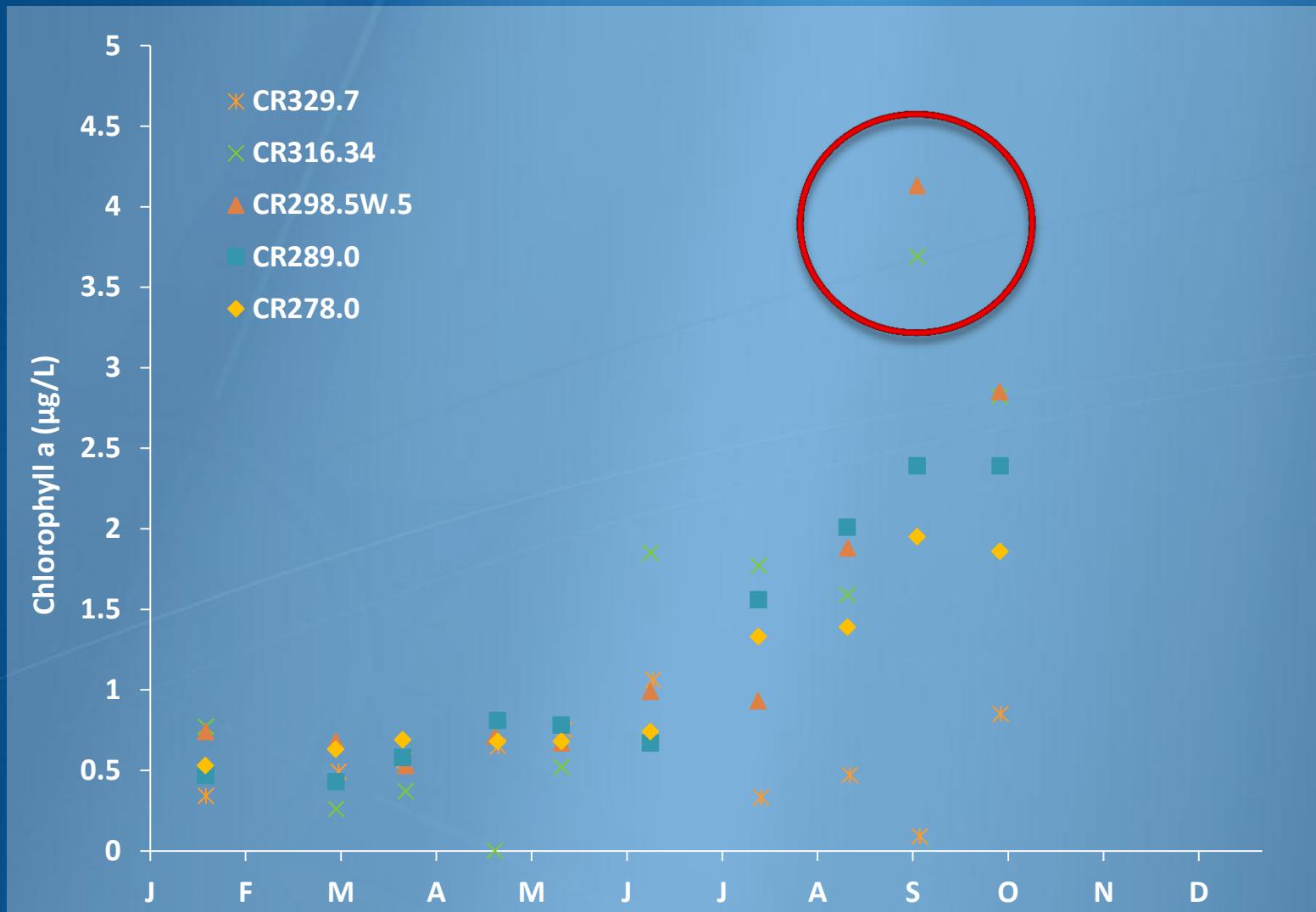
# Total Organic Carbon



# Epilimnetic Chlorophyll a

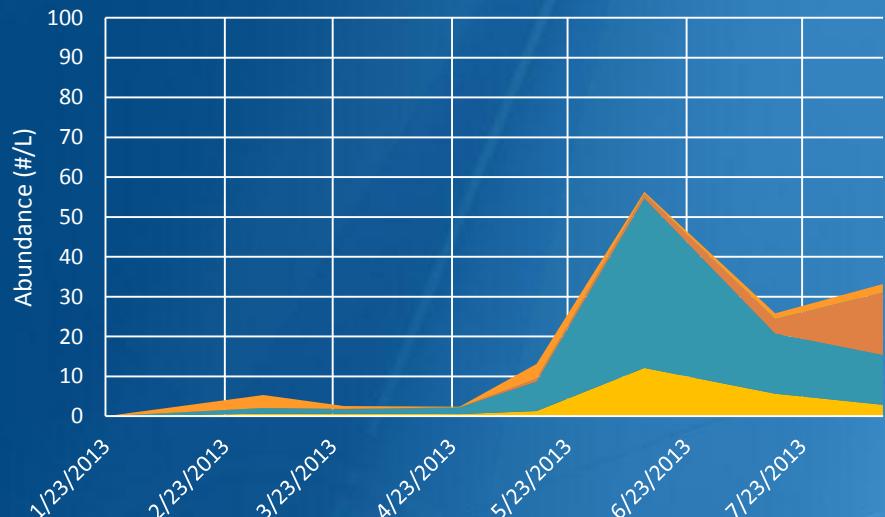


# Surface Chlorophyll a

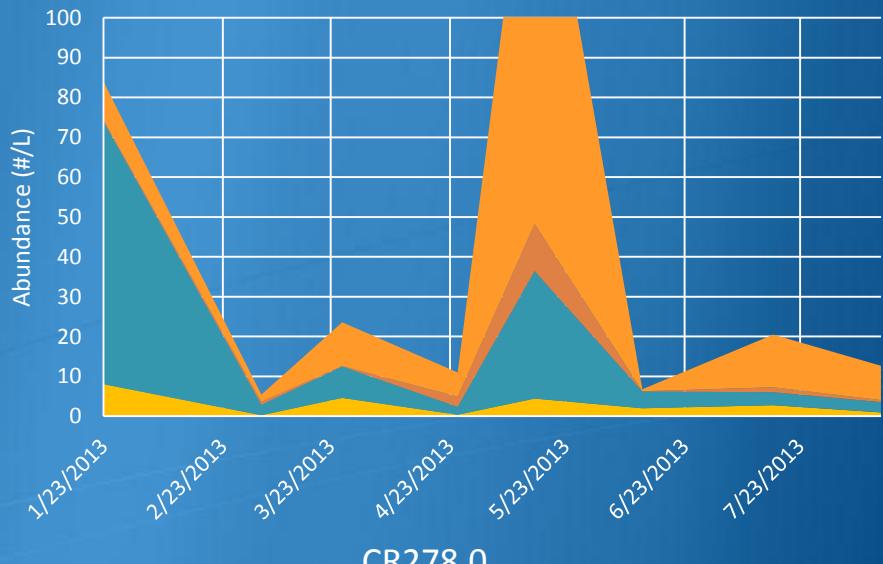


# Zooplankton

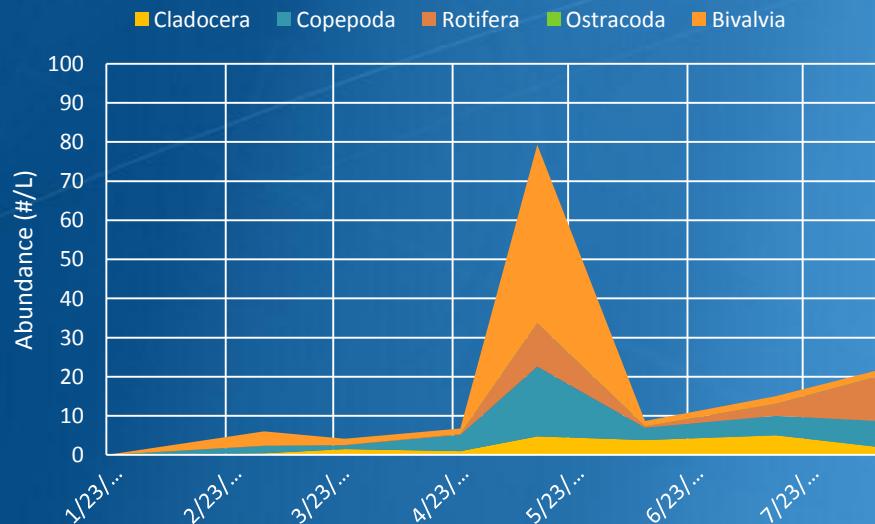
CR316.3



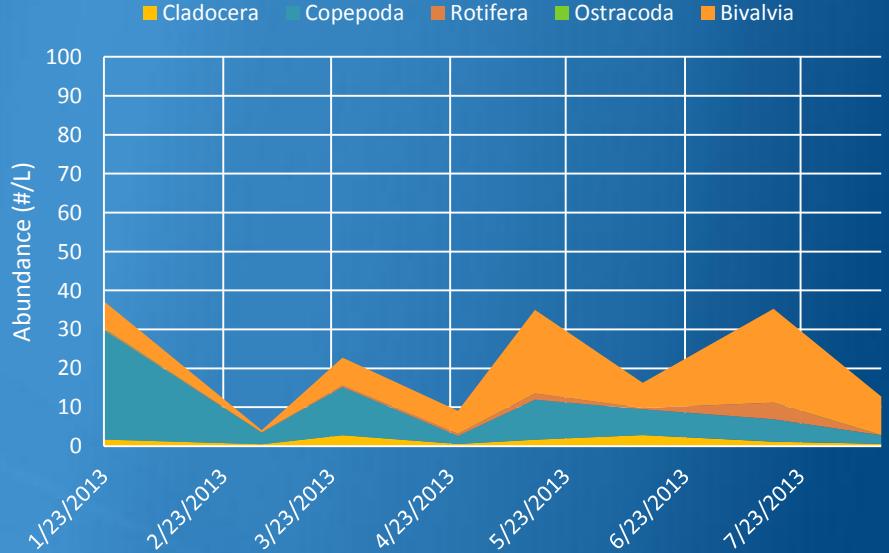
CR289.0



CR298.5



CR278.0



# Conclusions

- We need to keep sampling
  - Changing water levels in Lake Mead
  - No algal problem this year, but reported in the past
  - May need to consider moving sampling locations depending on data needs
- The water quality is generally reflective of Lake Mead water
  - Low phosphorus, “high” nitrogen, low chlorophyll
  - No algal toxins detected

# Conclusions

- The cold Hoover Dam releases do seem to travel the length of Lake Mohave as an underflow
  - Short hypolimnetic residence time
  - Long epilimnetic residence time
- Patterns near the dam appear to be complicated by the arrangement of Davis Dam and the withdrawal configuration
  - Reduced oxygen concentrations not expected
- pH patterns need to be considered in a broad context of Mead and Mohave

# Still to come

- Finish out the year
- Aquatic Invasive Plant Survey: Likely canceled
- Intensive sampling related to lake drawdown:  
Likely canceled
- Bathymetry
- Interesting location for diurnal studies
  - Strong diurnal wind impact
- Visitor “impacts”